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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,073	12/09/2003	Jia-Chong Ho	HOJ13001/EM	2765
23364	7590	03/01/2006	EXAMINER	
BACON & THOMAS, PLLC 625 SLATERS LANE FOURTH FLOOR ALEXANDRIA, VA 22314			TRAN, THANH Y	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 03/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/730,073

Applicant(s)

HO ET AL.

Examiner

Thanh Y. Tran

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-10 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawasaki et al (U.S. 2005/0127380) in view of Wahl et al (U.S. 4,321,163).

As to claim 1, Kawasaki et al discloses in figures 1A-3 a compound semiconductor material for forming an active layer of a thin film transistor device, comprising: a group II-VI compound ("ZnO") (see paragraph [0029]), the dopant is selected from group IIIA elements ("B, Al, Ga, In, Tl") (see paragraph [0029]).

Kawasaki et al does not disclose a group II-VI compound doped with a dopant ranging from 0.1 to 30 mol%. Wahl et al discloses in col. 4, lines 61-67 a compound doped with a dopant ranging from 0.1 to 30 mol% ("0.2 to 8 mole percent"). It should be noted that: "0.2 to 8 mole percent" falls in the range of 0.1 to 30 mol%. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the compound material of Kawasaki et al by using a rule of "from 0.1 to 30 mol%" for a dopant range of the compound as taught by Wahl et al for increasing the conductivity of the active layer of the thin film transistor device.

As to claim 2, Kawasaki et al discloses in figures 1A-3 a compound semiconductor material for forming an active layer of a thin film transistor device, wherein the group II-VI compound is ZnO ("ZnO") (see paragraph [0029]).

As to claim 3, Kawasaki et al discloses in figures 1A-3 a compound semiconductor material for forming an active layer of a thin film transistor device, wherein the group IIIA elements ("B, Al, Ga, In, Tl") (see paragraph [0029]).

As to claim 6, Kawasaki et al discloses in figures 1A-3 a compound semiconductor material for forming an active layer of a thin film transistor device, wherein the thin film transistor device is composed of a gate electrode (14), a source electrode (12), a drain electrode (13), a dielectric layer (15), and a substrate (16) (see paragraph [0025]).

As to claim 7, Kawasaki et al discloses in figures 1A-3 a compound semiconductor material for forming an active layer of a thin film transistor device, wherein the gate electrode, the source electrode, or the drain electrode of the thin film transistor device is made of metals (channel layer is made of metal "conductive layer") (see paragraph [0063]).

As to claim 8, Kawasaki et al discloses in figures 1A-3 a compound semiconductor material for forming an active layer of a thin film transistor device, wherein the dielectric layer (15) of the thin film transistor device is made of a high dielectric constant (see paragraph [0030]).

As to claim 9, Kawasaki et al discloses in figures 1A-3 a compound semiconductor material for forming an active layer of a thin film transistor device, wherein the substrate is a glass substrate (see paragraph [0031])

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawasaki et al (U.S. 2005/0127380) in view of Wahl et al (U.S. 4,321,163) as applied to claim 1 above, and further in view of Tanaka et al (U.S. 6,028,020).

As to claim 4, Kawasaki et al in view of Wahl et al does not teach a precursor solution of the compound semiconductor material is prepared by Sol-gel process.

Tanaka et al teaches in col. 3, lines 55-64 a precursor solution of the compound semiconductor material ("silicon compound") is prepared by Sol-gel process. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the compound semiconductor material of Kawasaki et al in view of Wahl et al by using Sol-gel process for a precursor solution of the compound semiconductor material as taught by Tanaka et al for forming the active layer so as to reduce the processing times.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawasaki et al (U.S. 2005/0127380) in view of Wahl et al (U.S. 4,321,163) as applied to claim 1 above, and further in view of Baek et al (U.S. 2003/0219920).

As to claim 5, Kawasaki et al in view of Wahl et al does not teach the active layer of the thin film transistor device is patterned by Micro Contact Printing.

Baek et al teaches in the paragraph [0043] the active layer of the thin film transistor device is patterned by Micro Contact Printing. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the method of Kawasaki et al in view of Wahl et al by using Micro Contact Printing process to form an active layer as taught by Baek et al for providing a pattern on the substrate of the thin film transistor device.

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5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawasaki et al (U.S. 2005/0127380) in view of Wahl et al (U.S. 4,321,163) as applied to claim 1 above, and further in view of Bai et al (U.S. 2004/0222412).

As to claim 8, Kawasaki et al in view of Wahl et al does not teach the dielectric constant of the dielectric layer is more than 3.

Bai et al teaches in the paragraph [0043] the dielectric constant of the dielectric layer is more than 3 (“at least about 3.5”). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Kawasaki et al in view of Wahl et al by using a dielectric layer with a constant of more than 3 as taught by Bai et al for providing a high dielectric constant in order to lower the operating voltages of device while maintaining the same charge polarization (see paragraph [0005] in Bai et al).

Response to Arguments

6. Applicant's arguments filed 11/30/05 have been fully considered but they are not persuasive.

Applicant argued that there is no disclosure of a compound semiconductor material for forming an active layer of a thin film transistor device that comprises a group II-VI compound doped with a dopant selected from a group consisting of at least one of alkaline-earth metals, group IIIA elements, group IVA elements, group VA elements, group VIA elements and transitional metals.

In response, the examiner disagrees with applicant's argument because Kawasaki et al clearly discloses in figures 1A-3 a compound semiconductor material, comprising: a group II-VI

compound (“ZnO”) (see paragraph [0029]) doped with a dopant is selected from a group consisting of at least one of alkaline-earth metals, group IIIA elements (“B, Al, Ga, In, Tl”) (see paragraph [0029]), group IVA elements, group VA elements, group VIA elements, and transitional metals. For the recitation of “for forming an active layer of a thin film transistor device” (as recited in claim 1) which has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicant further argued that there is no portion of Wahl can be combined with Kawasaki to disclose or suggest a group II-VI compound doped with of at least one of alkaline-earth metals, group IIIA elements, group IVA elements, group VA elements, group VIA elements and transitional metals.

In response, the examiner disagrees with applicant’s argument because Kawasaki et al clearly discloses all the limitations (as mentioned above), except for a dopant in the range from 0.1 to 30 mol%. Wahl et al discloses in col. 4, lines 61-67 a compound doped with a dopant ranging from 0.1 to 30 mol% (“0.2 to 8 mole percent”). It should be noted that: “0.2 to 8 mole percent” falls in the range of 0.1 to 30 mol%. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the compound material of Kawasaki et al by using a rule of “from 0.1 to 30 mol%” for a dopant range of the

compound as taught by Wahl et al for increasing the conductivity of the active layer of the thin film transistor device.

Applicant also argued that the Official Action fails to mention that Wahl teaches a lithium nitride compound and not a group II-VI compound or not a semiconductor material.

In response, the examiner disagrees with applicant's argument because the primary reference of Kawasaki et al clearly discloses a compound semiconductor material comprising: a group II-VI compound ("ZnO") (see paragraph [0029]). Secondary reference of Wahl does not need to disclose the same limitation that already disclosed in the primary reference of Kawasaki et al. Wahl only teaches the dopant range for a material is from 0.1 to 30 mol% ("0.2 to 8 mole percent") (see col. 4, lines 61-67).

Applicant further argued that Baek does not involve the group II-VI compound semiconductor material or dopants selected from the group consisting of alkaline-earth metals, group IIIA elements, group IVA elements, group VA elements, group VIA elements and transitional metals.

In response, the examiner disagrees with applicant's argument because Kawasaki et al clearly discloses all the limitations (as mentioned above), except for the active layer of the thin film transistor device is patterned by Micro Contact Printing. However, Baek et al teaches in the paragraph [0043] the active layer of the thin film transistor device is patterned by Micro Contact Printing. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the method of Kawasaki et al in view of Wahl et al by using Micro Contact Printing process to form an active layer as taught by Baek et al for providing a pattern on the substrate of the thin film transistor device.

Applicant further argued that Bai does not disclose compound semiconductor material for forming an active layer of a thin film transistor device.

In response, the examiner disagrees with applicant's argument because the recitation of "compound semiconductor material for forming an active layer of a thin film transistor device" (as recited in claim 1) which has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Y. Tran whose telephone number is (571) 272-2110. The examiner can normally be reached on M-F (9-6:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TYT


Zandra V. Smith
Supervisory Patent Examiner
Feb. 17, 2008